



TRICARE Data Quality Training Course

September 2011



DHSS Supports Enterprise-Wide Data Quality Efforts



Objectives

- Why data quality matters
- How our tools affect data quality
- How you can use this information in your data quality program

DHSS

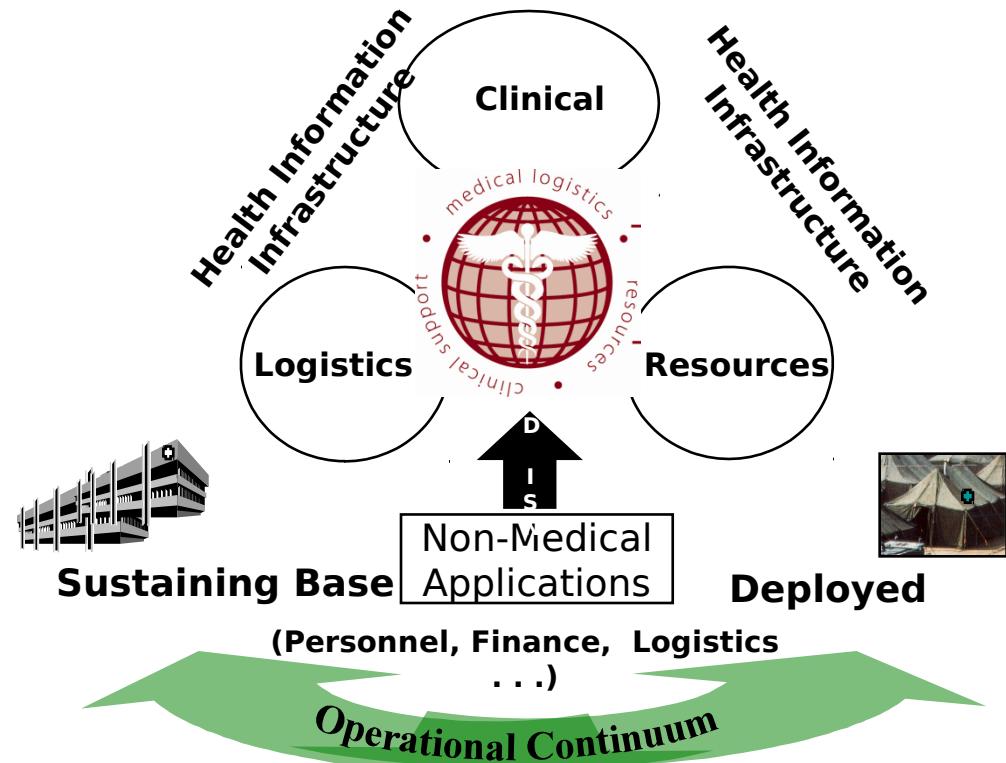
- MHS centralized data store
- Receive, analyze, process, and store 100+ terabytes of data
- Thousands of users worldwide

What is DHSS?

View

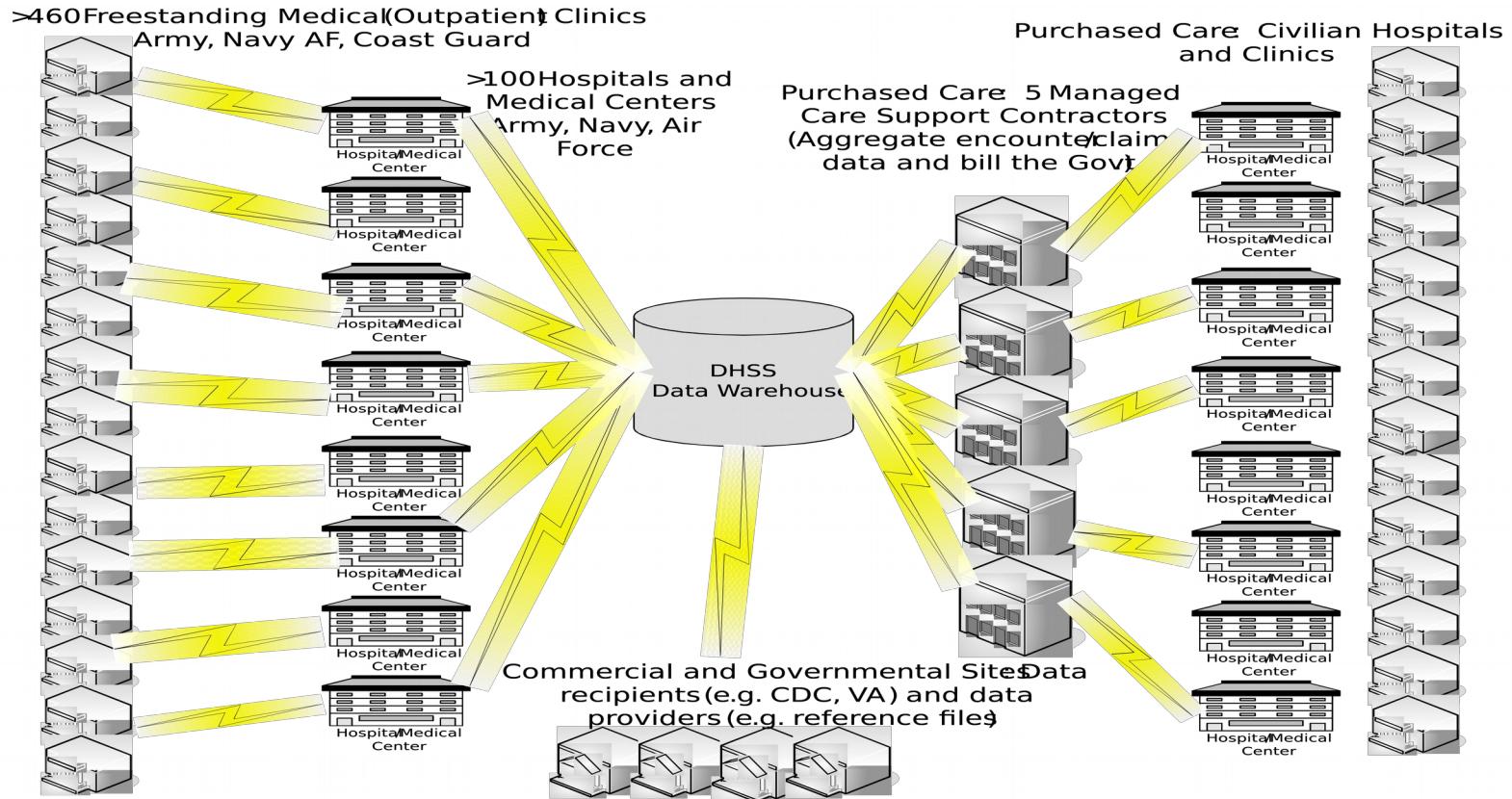
40,000 Foot

- TRICARE decision support that makes the vision of the Military Health System Plan possible
- Military Health System technology that integrates and standardizes clinical, resource, population, logistics, and other referential information



What is DHSS? View

20,000 Foot

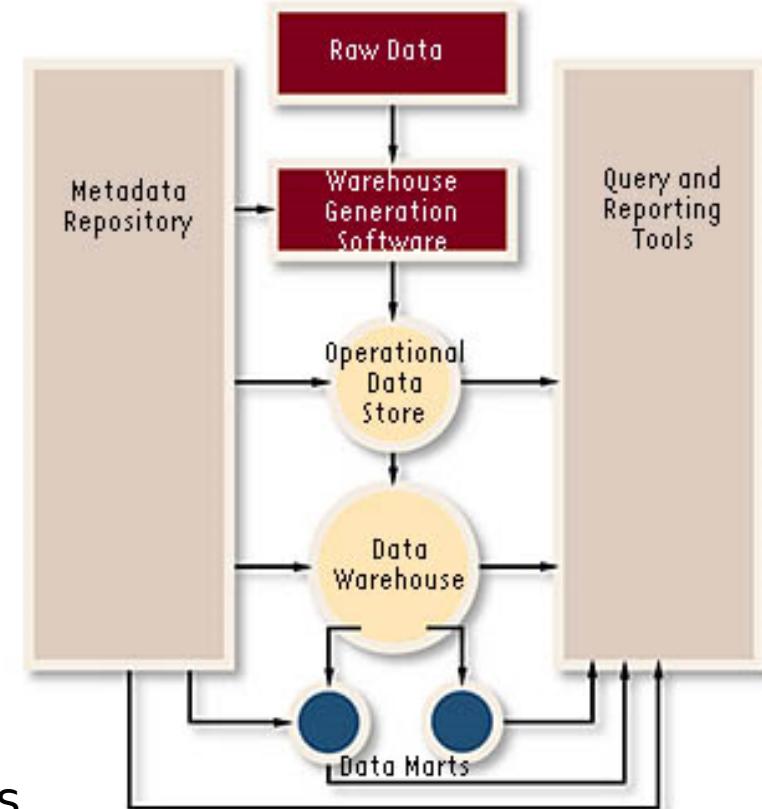


> 10 Million Beneficiaries

Direct (Military Provided) Care:	Inpatient: 250,000 Annually Outpatient: 30 Million Annually
Purchased (Civilian Provided) Care	Inpatient Claims: 800,000 Annually Outpatient "Claims": 100 Million Annually

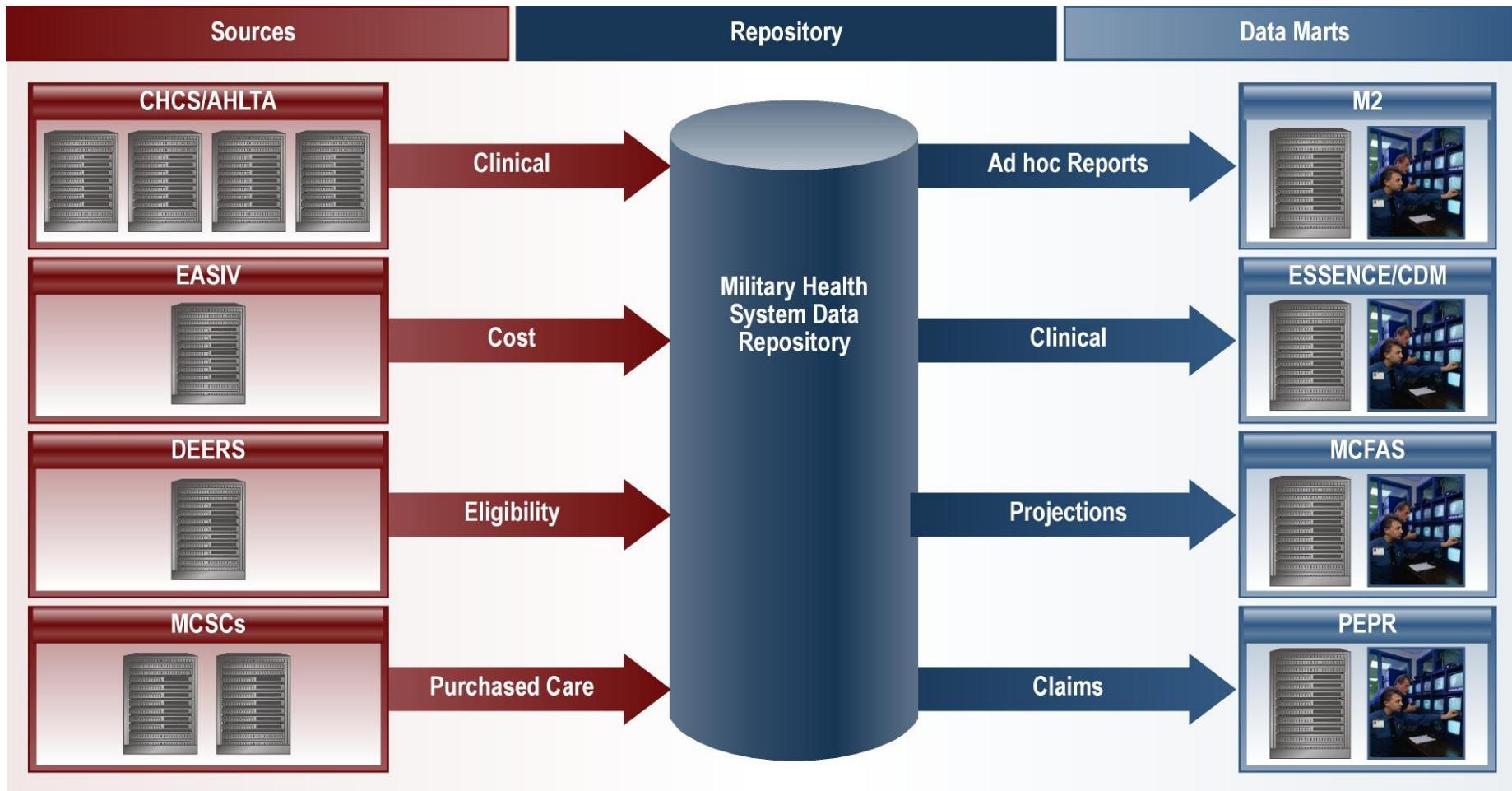
DHSS - The Healthcare Data Warehouse 5,000 Foot View

- **A wide variety of healthcare data**
 - Rx, Lab, Rad, etc
 - Inpatient Episodes
 - Outpatient Encounters
 - Survey Data
 - Enrollment Data
 - Reference Data
 - Claims Data
- **Collects and distributes data**
 - Daily, weekly, and monthly
 - From over 460 freestanding clinics and 100 hospitals
 - From thousands of civilian facilities
 - Worldwide geographic distribution

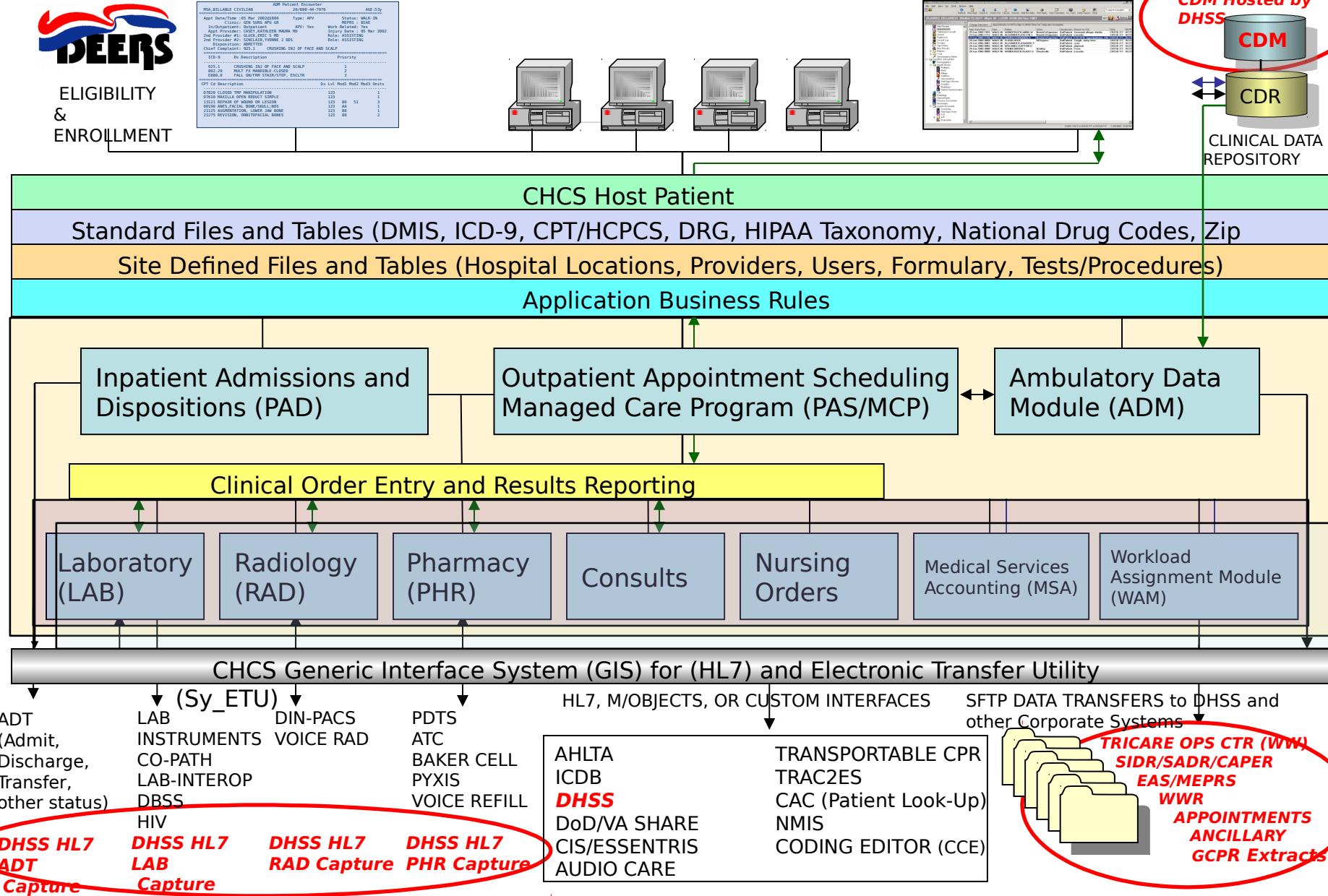


DHSS Architecture View

1,000 Foot



CHCS Host Architecture and DHSS Interfaces



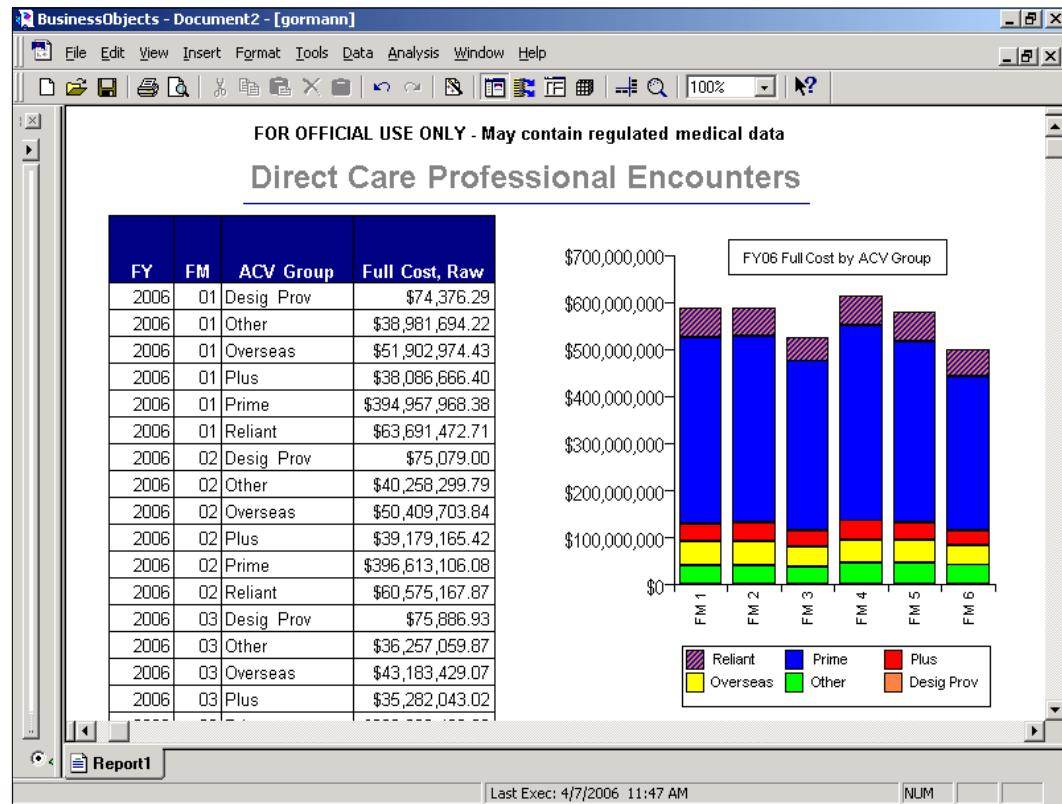
MDR (MHS Data Repository)

- Centralized data capture and validation of MHS data worldwide
- More than 5 billion records on-line with 10+ years of data
- Provides repository for other systems/applications to receive extracts
- Typical users: small cadre of high-level data analysts



M2 (MHS Management Analysis & Reporting Tool)

- Powerful ad hoc query tool for detailed trend analysis such as patient and provider profiling
- Typical users: Data analysts skilled in Business Objects software



DHSS Data Quality Requirements



- Capture and catalog data files
- Assess and monitor data completeness
- Perform data quality assessments (basic validity checks)
- Develop and maintain data quality software that:
 - ✖ Performs automatic data quality checks
 - ✖ Implements data quality assessments
 - ✖ Provides metrics and manages perspective of the files' data quality
 - ✖ Provide feedback on “outliers” to respective services, sites or POC's

DHSS Data Quality Metrics Address:



- **Integrity:** is it secure?
- **Relevancy:** is it appropriate?
 - Reliability: is it rationally correlated? (e.g. CAPER vs Appts vs SADRs)
 - Validity: is it sound? (e.g. not from TEST MEPRS codes, does it represent a valid encounter)
- **Consistency:** is it free from contradiction?
 - Uniqueness: is it free from duplication?
- **Timeliness:** is it available when needed?
 - E.g. What are the lag times from encounter to visibility in datamarts?
- **Completeness:** is it whole?
 - e.g. truncated/aberrant/malformed
- **Accuracy:** is it free from error?
 - “Functional” analysis and ingest business

DHSS's Data Quality Tools



- A **Real-time/Run-time** data quality/completeness database for:
 - SIDR SADR CAPER HL7 PDTs Appointment Ancillary Data Types
- Database updated daily and scripted to provide **“event-driven” alerts** via e-mail for critical data quality issues or problems
- For DMIS ID's, “real time” and “snapshot” views of key data completeness measures
- Internal access for standard “canned” Data Quality/Completeness reports
- Multilayer data comparisons from raw to processed data for procedure-based actions
- Multilayer comparisons of related data types (e.g. SADR vs CAPER vs Appt vs WWR vs MEPRS)
- Statistical process control algorithms and control charts

DHSS's “Data Tracker”



- Essentially a “Mini MDR/M2”. Data processed in real time
- Data Tracker tools and reports
 - SIDR, SADR, CAPER, HL7, Appointment, Ancillary, TED Inst/Non-Inst reports provide:
 - File based accounting (e.g. Gap reports)
 - Treatment based accounting (e.g. reports based on care date)
 - Timeliness reporting (e.g. lag from care rendered date to ingest)
 - Other statistical reports including benchmarking against WWR
 - Statistical Process Control Alerting for SADR/CAPER anomalies
 - Other Data Tracker tools and reports
 - Monthly reports (SIDR and SADR/CAPER vs WWR and Appointments – “Benchmarking”)
 - Ad Hoc Queries to the Data Tracker
 - Gap Reports – Receipt Reports – Pull Reports
 - Current Data Tracker reports on the DHSS Web site
 - Daily SADR by HOST DMIS (The **“What Was Received Yesterday”** Report)
 - Daily SADR by Treatment ID – 90 Day (The daily **“90 Day Roller”** Report)
 - Monthly SIDR by Treatment DMIS

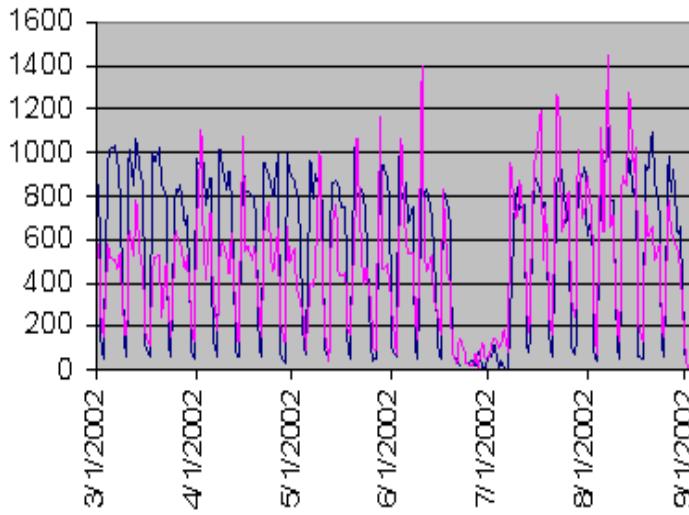
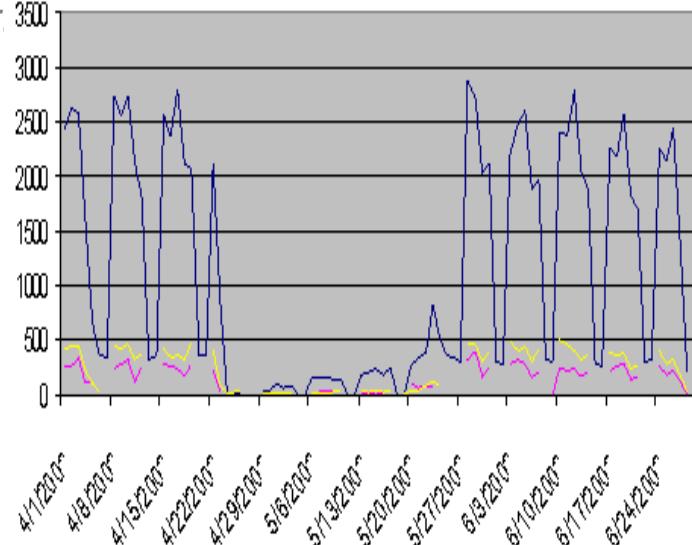
Basic Data Quality Assurance Tools



Start with Run Charts

Example of facilities showing gaps in daily outpatient encounter data receipt. Investigation and data recovery actions required.

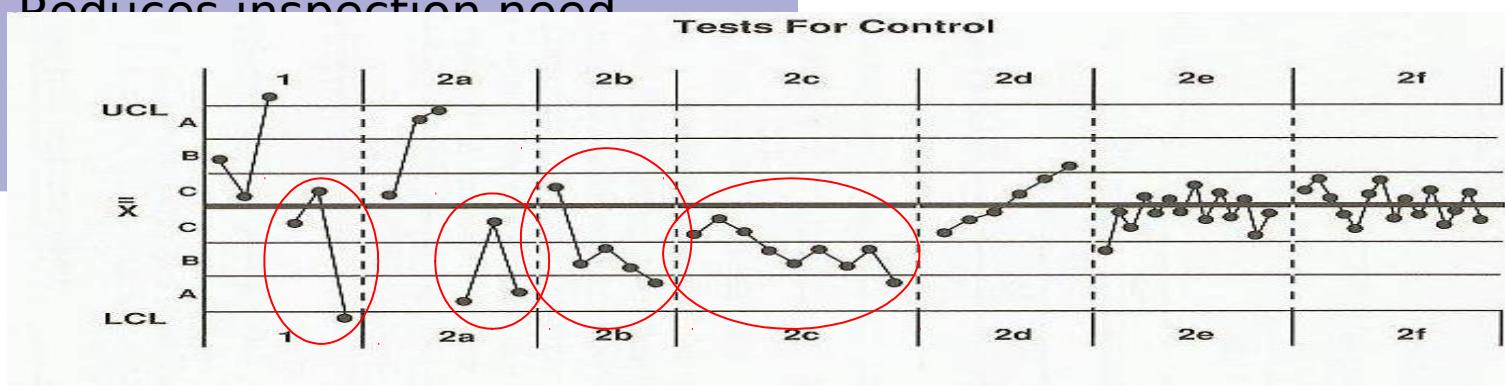
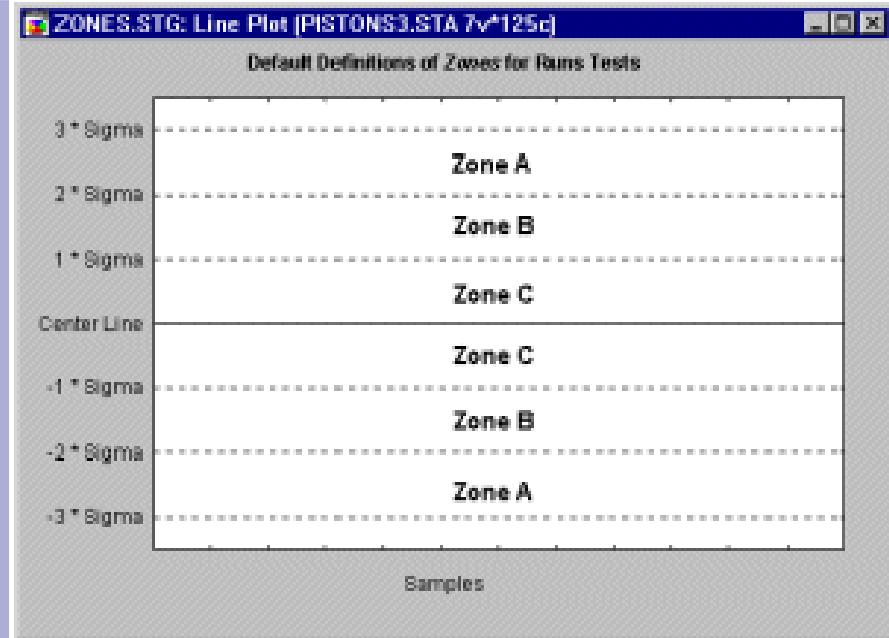
Data set has no correlation with other source system provided data



Data Completeness Determination

“Completeness” as a Process Control Problem

- Amenable to Statistical\Process Control
- Examine for Special Cause Variation
- Signals when a problem has occurred
- Detects variation
- Allows “Process Characterization”
- Reduces inspection need



Compare Each Day To Itself

Project previous data to today then compare this projection with newly arrived data.

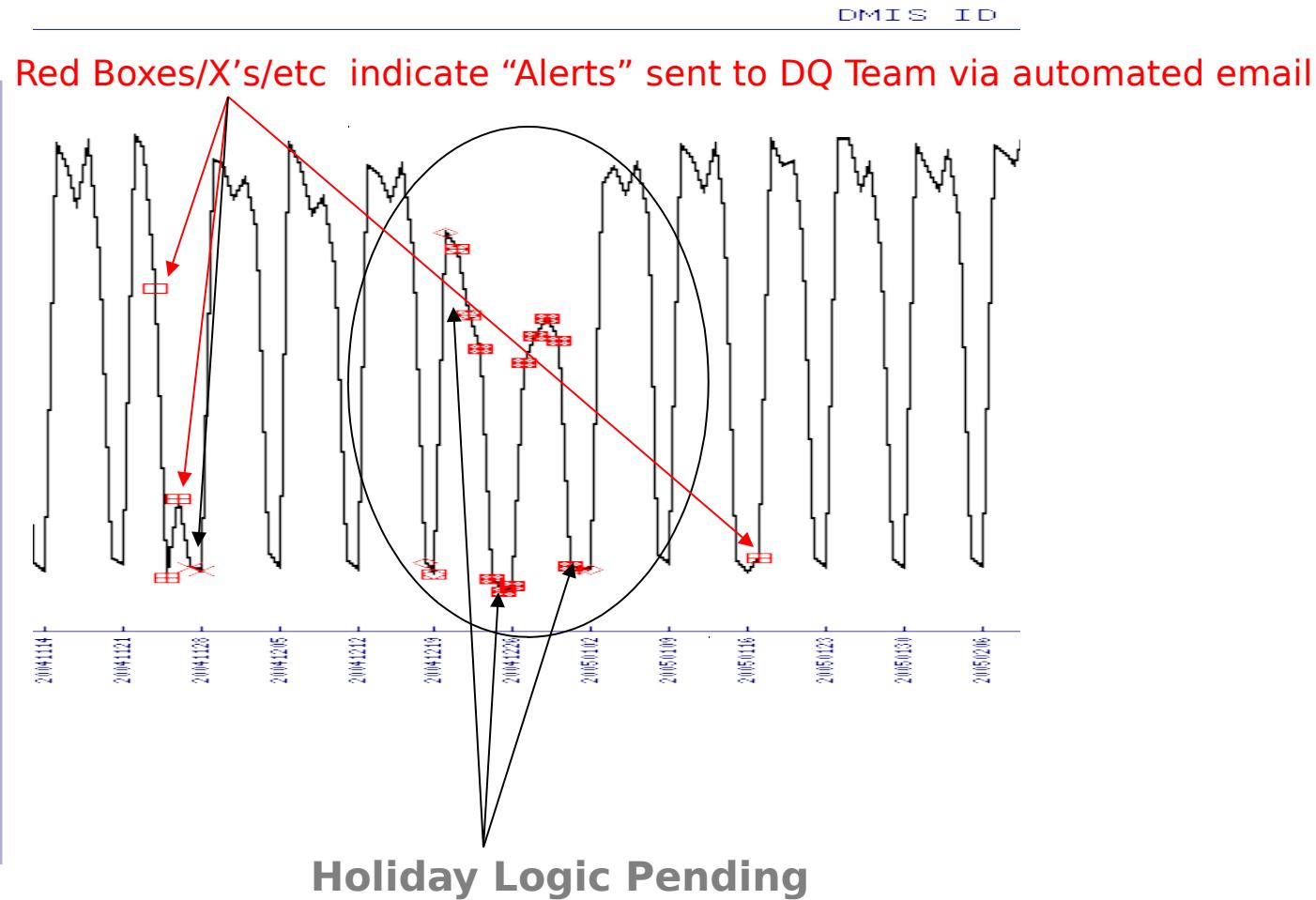


Chart: Encounters by Day

Identifying Data Completeness Problems

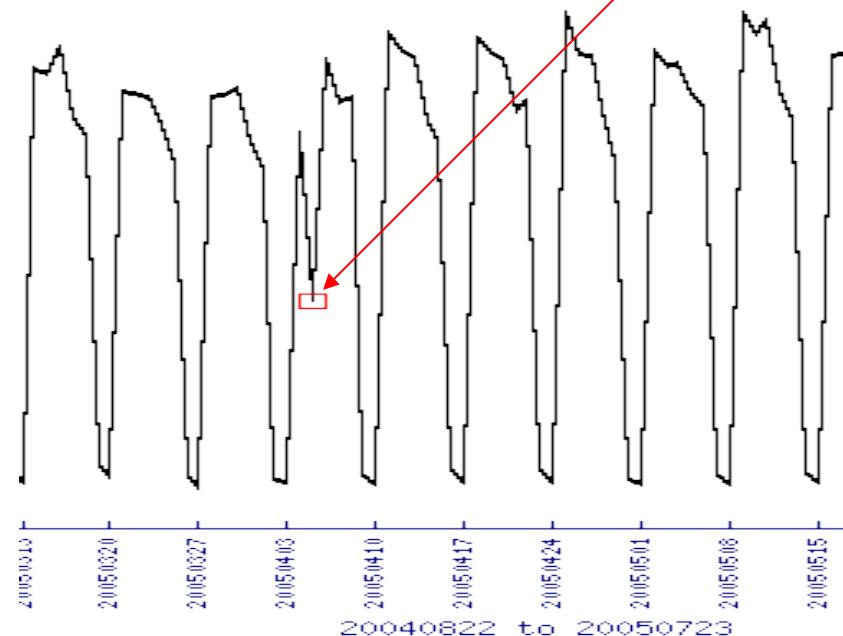


Red boxes/Xs/etc. indicate automatic e-mail
“Alerts” to the data quality team.

Alerting and Notification Issue

How do you identify and present
“possible” problems
when:

- the “problem” is transient,
- it is one data point in a series,
- it is from one of a vast number of daily input data sources?



Essentially a projection of previous data forward in time to today then a comparison of this projection with the newly arrived data.

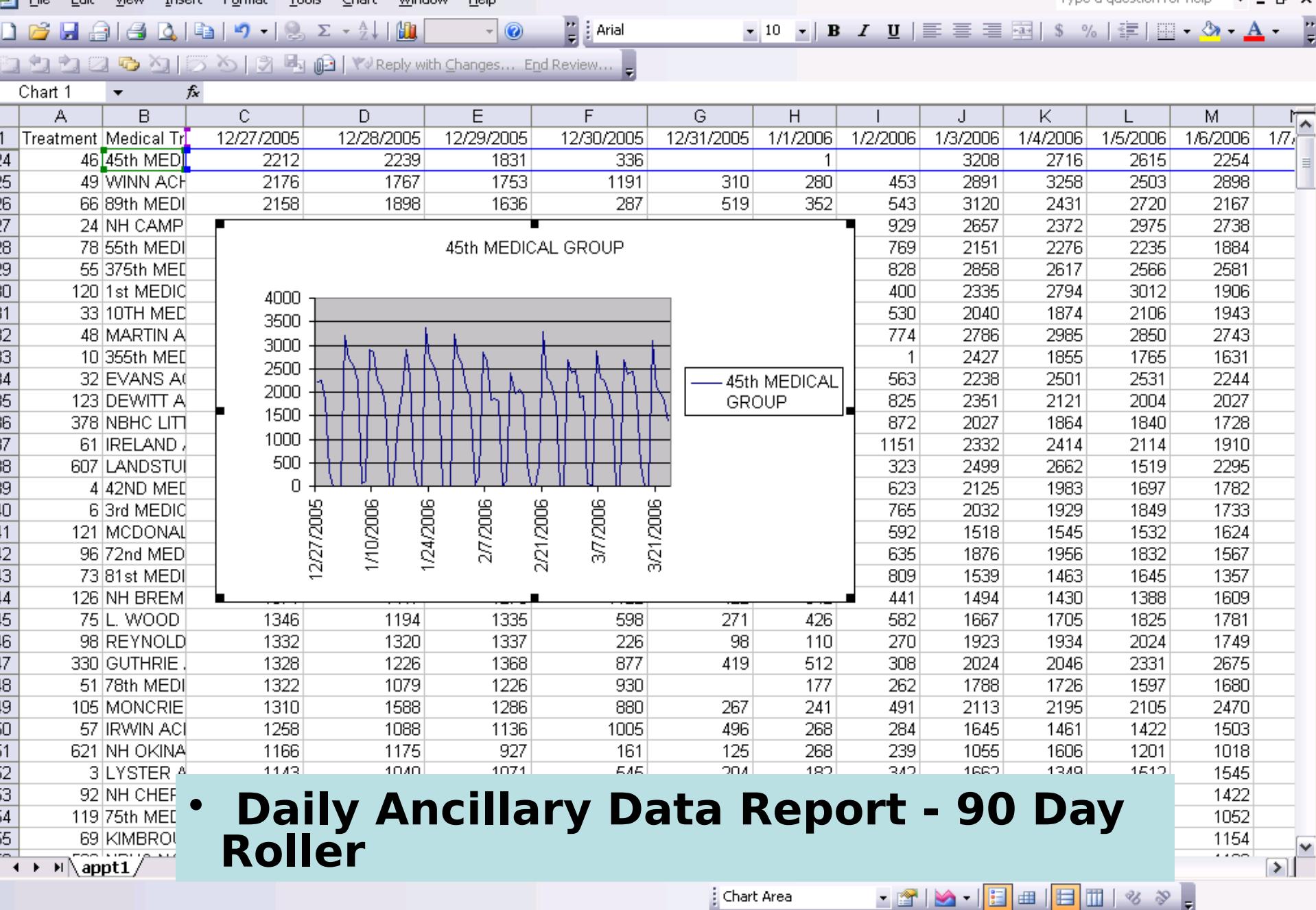
Data Tracker Report Series including:

- **SADR vs Appts vs WWR Tracking (AKA “The Hutchinson Report”)**
- **SADR vs Appointment Delta Alerting**

3	A	B	C	F	G	L	M	N	Q	R	S	X	Y	Z	AE	AF	AG	AL	AM		
1						SADR - includes appt inferred - APPTS		Consistency Variable APPT Inferred SADRs as % of All SADRs	SADR - MEPRSCD B		Ext Consistency B MEPR SADR as % of Same Month RAW SADR		SADR		Ext Consistency raw SADR as % of Same Month WWR		WWR		Ext Consistency APPTS (Inferred SADR) as % of Same Month WWR		MEPRS
2	BRANCH	DMISID	FACILITY	MONTH		ADec10	AJan11		HDec10	HJan11		SDec10	SJan11		WDec10	WJan11		MDec10	MJan11		
1027	0058 Total				205,128	216,203		182,973	192,901		198,745	209,425		107,999	114,667		103,862	112,00			
1028	F	0059	22nd MEDICAL GROUP	Oct-09	6,887	6,887	14.38%	5,857	5,857	99.32%	5,897	5,897	126.57%	4,659	4,659	147.82%	4,652	4,65			
1029	F	0059	22nd MEDICAL GROUP	Nov-09	5,679	5,679	10.00%			99.55%	5,111	5,111	120.60%	4,238	4,238	134.00%	4,238	4,23			
1030	F	0059	22nd MEDICAL GROUP	Dec-09	5,381	5,381	1.17%	5,283	5,283	99.34%	5,318	5,318	117.29%	4,534	4,534	118.68%	4,472	4,47			
1031	F	0059	22nd MEDICAL GROUP	Jan-10	6,060	6,060	1.60%	5,934	5,934	99.51%	5,963	5,963	120.12%	4,964	4,964	122.08%	4,918	4,91			
1032	F	0059	22nd MEDICAL GROUP	Feb-10	5,726	5,726	1.35%	5,617	5,617	99.43%	5,649	5,649	119.25%	4,737	4,737	120.88%	4,679	4,67			
1033	F	0059	22nd MEDICAL GROUP	Mar-10	7,789	7,789	1.70%	7,609	7,609	99.37%	7,657	7,657	119.38%	6,414	6,414	121.44%	6,414	6,41			
1034	F	0059	22nd MEDICAL GROUP	Apr-10	7,430	7,430	1.35%	7,281	7,281	99.33%	7,330	7,330	119.79%	6,119	6,119	121.43%	6,119	6,11			
1035	F	0059	22nd MEDICAL GROUP	May-10	6,273	6,273	1.31%	6,154	6,154	99.40%	6,191	6,191	124.54%	4,971	4,971	126.19%	4,946	4,94			
1036	F	0059	22nd MEDICAL GROUP	Jun-10	6,800	6,799	1.47%	6,633	6,632	99.00%	6,700	6,699	125.00%	5,359	5,359	126.87%	5,359	5,35			
1037	F	0059	22nd MEDICAL GROUP	Jul-10	6,083	6,083	1.13%	5,979	5,979	99.30%	6,011	6,011	119.88%	5,005	5,005	121.85%	5,005	5,00			
1038	F	0059	22nd MEDICAL GROUP	Aug-10	6,613	6,612	1.41%	6,484	6,484	99.26%	6,511	6,511	125.00%	5,005	5,005	126.87%	5,005	5,00			
1039	F	0059	22nd MEDICAL GROUP	Sep-10	6,340	6,340	2.16%	6,141	6,141	99.22%	6,271	6,271	125.00%	5,005	5,005	126.87%	5,005	5,00			
1040	F	0059	22nd MEDICAL GROUP	Oct-10	6,052	6,052	1.83%	5,900	5,900	99.18%	6,021	6,021	125.00%	5,005	5,005	126.87%	5,005	5,00			
1041	F	0059	22nd MEDICAL GROUP	Nov-10	6,114	6,156	1.82%	5,886	5,886	99.14%	6,091	6,091	125.00%	5,005	5,005	126.87%	5,005	5,00			
1042	F	0059	22nd MEDICAL GROUP	Dec-10	727	5,720	1.40%	719	719	99.10%	6,051	6,051	125.00%	5,005	5,005	126.87%	5,005	5,00			
1052	0059 Total				89,954	94,987		86,565									65.83				
1053	A	0060	BLANCHFIELD ACH	Oct-09	72,945	72,945	2.92%	62,235									72,60				
1054	A	0060	BLANCHFIELD ACH	Nov-09	71,171	71,169	2.72%	54,836	54,834	79.20%	67,225	67,231	153.00%	51,712	51,712	157.03%	53,400	63,40			
1055	A	0060	BLANCHFIELD ACH	Dec-09	64,285	64,286	2.72%	48,085	48,086	76.89%	62,528	62,535	138.16%	45,263	45,263	142.03%	55,994	55,99			
1056	A	0060	BLANCHFIELD ACH	Jan-10	65,178	65,177	2.90%	51,785	51,785	81.82%	63,288	63,290	129.17%	48,999	48,999	133.02%	60,689	60,68			
1057	A	0060	BLANCHFIELD ACH	Feb-10	61,970	61,970	2.71%	49,003	49,003	81.27%	60,291	60,293	130.80%	46,095	46,095	134.44%	58,033	58,03			
1058	A	0060	BLANCHFIELD ACH	Mar-10	76,743	76,743	2.93%	60,493	60,493	81.21%	74,492	74,492	130.55%	57,062	57,062	134.49%	71,913	71,91			
1059	A	0060	BLANCHFIELD ACH	Apr-10	69,665	69,664	2.93%	55,270	55,269	81.73%	67,618	67,621	130.01%	52,012	52,012	133.94%	64,344	64,34			
1060	A	0060	BLANCHFIELD ACH	May-10	57,871	57,871	2.91%	44,895	44,895	79.91%	56,185	56,185	131.75%	42,644	42,644	135.71%	50,668	50,66			
1061	A	0060	BLANCHFIELD ACH	Jun-10	60,914	60,917	3.07%	46,359	46,362	78.51%	59,045	59,049	136.52%	43,252	43,252	140.84%	52,816	52,81			
1062	A	0060	BLANCHFIELD ACH	Jul-10	58,712	58,716	2.96%	45,505	45,509	79.87%	56,972	56,978	132.71%	42,935	42,935	136.76%	52,783	52,78			
1063	A	0060	BLANCHFIELD ACH	Aug-10	70,716	70,760	2.90%	54,037	54,080	78.71%	68,654	68,706	134.57%	51,057	51,057	138.59%	60,890	60,89			
1064	A	0060	BLANCHFIELD ACH	Sep-10	68,341	68,374	2.68%	51,932	51,961	78.09%	66,498	66,539	136.08%	48,896	48,896	139.84%	58,873	58,87			
1065	A	0060	BLANCHFIELD ACH	Oct-10	64,576	64,574	3.05%	49,744	49,744	79.46%	62,580	62,603	136.50%	45,864	45,864	140.79%	55,055	55,05			
1066	A	0060	BLANCHFIELD ACH	Nov-10	63,442	63,641	2.71%	49,132	49,223	79.50%	61,618	61,916	136.47%	45,371	45,371	140.27%	54,57	54,57			
1067	A	0060	BLANCHFIELD ACH	Dec-10	7,163	52,918	2.70%	5,165	40,193	78.06%	7,163	51,488	133.21%	38,652	38,652	136.91%					
1068	A	0060	BLANCHFIELD ACH	Jan-11		258	0.00%		47	18.22%		258									

Sharp increase in the difference between SADR and Appointments.

Audience Participation: Possible Causes?



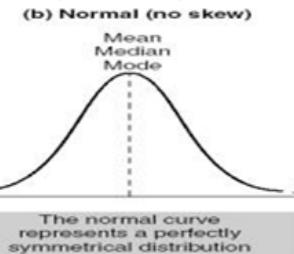
• Daily Ancillary Data Report - 90 Day Roller

Data Quality Tools – “Encounter Timeliness”

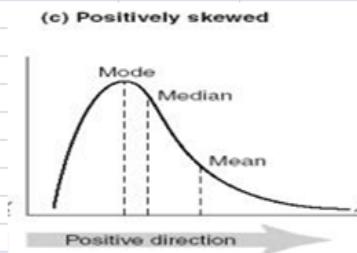
Medical Treatment Facility	N (# of Encounters)	Mean	Standard Deviation
110 DARNALL AMC	169464	2.94	3.82
125 MADIGAN AMC	169193	4.75	6.74
109 BROOKE AMC	155957	4.35	5.38
89 WOMACK AMC	154777	3.47	4.25
117 59th MEDICAL WING	153855	4.76	5.45
29 NMC SAN DIEGO	145880	6.07	7.8
32 EVANS ACH	144485	3.19	4.06
124 NMC PORTSMOUTH	144467	5.15	7.88
37 WALTER REED ARMY MEDICAL CENTE	142962	3.82	5.93
52 TRIPLEX AMC	141958	4.2	4.49
60 BLANCHFIELD ACH	139950	3.09	2.75
47 EISENHOWER AMC	118785	4.12	4.35
67 NNMC BETHESDA	117449	3.92	5.56
98 REYNOLDS ACH	102356	3.01	3.08
61 IRELAND ACH	98378	2.82	2.34
91 NH CAMP LEJEUNE	98277	3.89	6.91
108 WILLIAM BEAUMONT AMC	96737	4.22	5.05
48 MARTIN ACH	89883	2.86	2.27
49 WINN ACH	81377	2.88	2.49
14 60th MEDICAL GROUP	77770	4.44	6.03
75 L. WOOD ACH	73648	2.76	2.45
607 LANDSTUHL REGIONAL MEDCEN	73289	4.09	6.88
24 NH CAMP PENDLETON	73220	3.78	4.96
57 IRWIN ACH	71413	3.02	3.34
123 DEWITT ACH	71154	3.14	3.55
95 88th MEDICAL GROUP	69474	2.69	4.12
6 3rd MEDICAL GROUP	65102	3.7	4.06
330 GUTHRIE AHC	60978	2.83	2.4
42 96th MEDICAL GROUP	59496	3.93	4.17
79 MIKE OCALLAGHAN FEDERAL HOSPITA	58834	3.44	3.77
39 NH JACKSONVILLE	58208	4.18	4.51
64 BAYNE-JONES ACH	56231	2.57	2.89
437 SCHOFIELD BARRACKS AHC	55121	2.49	1.81
120 1st MEDICAL GROUP	54822	3.47	4
73 81st MEDICAL GROUP	54446	2.50	2.66

Site has the most encounters for the time frame. They do well on this metric compared to other large facilities. [Relatively low mean AND standard deviation, recall that 1.0 is the "lowest" obtainable mean, and 2.0 (2 days from encounter to receipt) a more realistic expectation]

What do THEY do, that the others do not? Why is their Standard Deviation more "Bell Curve" like than others?



Since greater Standard Deviation = 's more "Variation", some locations or other factors within the facility must do much better than others.



Data Quality Reporting - “ER Timeliness”

High Mean

DMIS	Medical Treatment Facility
110	DARNALL AMC
60	BLANCHFIELD ACH
29	NMC SAN DIEGO
89	WOMACK AMC
125	MADIGAN AMC
32	EVANS ACH
117	59th MEDICAL WING
124	NMC PORTSMOUTH
108	WILLIAM BEAUMONT AMC
109	BROOKE AMC
52	TRIPLER AMC
91	NH CAMP LEJEUNE
24	NH CAMP PENDLETON
79	MIKE OCALLAGHAN FEDERAL HOSPITAL
47	EISENHOWER AMC
39	NH JACKSONVILLE
75	L. WOOD ACH
49	WINN ACH
57	IRWIN ACH
48	MARTIN ACH
6	3rd MEDICAL GROUP
42	96th MEDICAL GROUP
98	REYNOLDS ACH
123	DEWITT ACH
126	NH BREMERTON
61	IRELAND ACH
607	LANDSTUHL REGIONAL MEDCEN
38	NH PENSACOLA
621	NH OKINAWA

Deviation is worse than High Mean - High Standard Deviation

Why?

Low Std Dev means MOST records come in near the mean.

High Std Dev means (in this example)

Service	N	Mean	Std
A	6614	2.86	2.83
A	6234	4.42	1.65
N	5516	20.38	4.51
A	5261	2.66	1.56
A	5214	2.24	0.71
A	4685	3.11	1.24
F	4647	9.53	7.05
N	4539	38.6	2.02
A	4279	3.9	2.93
A	4147	3.51	2.47
A	4144	4.9	4.55
N	3701	23.72	15.04
N	3397	2.41	0.72
F	3226	4.09	0.9
A	3073	3.81	1.14
N	2972	7.73	3.25
A	2940	2.47	0.64
A	2816	3.36	3.1
A	2745	2.51	1.2
A	2712	2.74	1.38
F	2637	6.2	2.96
F	2635	6.31	1.94
A	2615	2.74	3.02
A	2598	3.69	1.41
N	2259	2.41	0.79
A	2216	3.51	0.99
A	2189	2.96	3.56
N	2187	2.85	2.8
N	2030	5.17	2.65

mean upwards

Data Quality Tools - “Difference Detectors”

DMIS	Facility Name	FY	FM	Month	CAPER	SADR	CAPER visits / SADR
0208	BMC MCB CAMP PENDLETON	2008	05	Feb-08	2,291	2,290	100.04%
0208	BMC MCB CAMP PENDLETON	2008	06	Mar-08	2,554	2,316	110.28%
0297	NACC NEW ORLEANS	2003	01	Oct-02	.	2,140	0.00%
0297	NACC NEW ORLEANS	2003	02	Nov-02	.	1,999	0.00%
0297	NACC NEW ORLEANS	2003	03	Dec-02	.	1,978	0.00%
0297	NACC NEW ORLEANS	2003	04	Jan-03	.	2,281	0.00%
0297	NACC NEW ORLEANS	2003	05	Feb-03	.	2,114	0.00%
0297	NACC NEW ORLEANS	2003	06	Mar-03	.	2,134	0.00%
0297	NACC NEW ORLEANS	2003	07	Apr-03	.	2,300	0.00%
0297	NACC NEW ORLEANS	2003	08	May-03	.	2,271	0.00%
0297	NACC NEW ORLEANS	2003	09	Jun-03	.	2,192	0.00%
0297	NACC NEW ORLEANS	2003	10	Jul-03	.	1,964	0.00%
0297	NACC NEW ORLEANS	2003	11	Aug-03	.	1,704	0.00%
0297	NACC NEW ORLEANS	2003	12	Sep-03	.	1,715	0.00%
0297	NACC NEW ORLEANS	2004	01	Oct-03	.	1,621	0.00%
0297	NACC NEW ORLEANS	2004	02	Nov-03	.	1,106	0.00%
0297	NACC NEW ORLEANS	2004	03	Dec-03	.	1,658	0.00%
0297	NACC NEW ORLEANS	2004	04	Jan-04	.	1,497	0.00%
0297	NACC NEW ORLEANS	2004	05	Feb-04	.	1,315	0.00%
0297	NACC NEW ORLEANS	2004	06	Mar-04	.	1,417	0.00%
0297	NACC NEW ORLEANS	2004	07	Apr-04	23	1,329	1.73%
0297	NACC NEW ORLEANS	2004	08	May-04	1,095	1,099	99.64%
0297	NACC NEW ORLEANS	2004	09	Jun-04	1,184	1,184	100.00%
0297	NACC NEW ORLEANS	2004	10	Jul-04	1,116	1,116	100.00%
0297	NACC NEW ORLEANS	2004	11	Aug-04	1,116	1,089	102.48%
0297	NACC NEW ORLEANS	2004	12	Sep-04	860	860	100.00%
0297	NACC NEW ORLEANS	2005	01	Oct-04	1,206	1,206	100.00%
0297	NACC NEW ORLEANS	2005	02	Nov-04	1,157	1,158	99.91%
0297	NACC NEW ORLEANS	2005	03	Dec-04	981	986	99.49%
0297	NACC NEW ORLEANS	2005	04	Jan-05	1,156	1,158	99.83%
0297	NACC NEW ORLEANS	2005	05	Feb-05	981	983	99.80%
0297	NACC NEW ORLEANS	2005	06	Mar-05	1,113	1,113	100.00%

Data Quality Tools - “Difference Detectors”

Tmt	Par	Tmt	Parent	DMIS ID	Name	Day of week												Day of week											
						40	41	42	43	44	45	46	47	48	49	50	51	52	1	2	3	4	5	6	7				
0029	NMC SAN DIEGO					3	601	198	212	70	250	205	230	207	186	182	189	188	1	3	198	381	205	288	209	282	2		
0029	NMC SAN DIEGO					4	288	139	332	135	207	225	175	150	250	206	212	184	101	164	221	219	221	256	238	191	2		
0029	NMC SAN DIEGO					5	210	168	150	169	137	191	154		183	134	139	125	110	180	212	178	195	160	223	154	2		
0029	NMC SAN DIEGO					6	186	94	106	94	142	117	154	128	122	136	164	148	86	148	138	148	182	166	192	138	1		
0029	NMC SAN DIEGO					7	25	4	6	13	43	6	4	3	3	19	74	8	8	3	9	6	6	7	4	9			
0030	NH TWENTYNINE PALMS					1	4													2						1			
0030	NH TWENTYNINE PALMS					2	88		31	22	18	16		30	24	33	27	13			28	34		11	20	34			
0030	NH TWENTYNINE PALMS					3	96	22	24	13	16	14	1	29	27	32	26	3		20	38	23	12	29	35				
0030	NH TWENTYNINE PALMS					4	28	28	28	23	22	29	24	48	27	40	39	20	20	23	25	19	12	17	22				
0030	NH TWENTYNINE PALMS					5	37	31	27	25	23	28	32		27	28	6	22	2	21	26	38	26	11	17	61			
0030	NH TWENTYNINE PALMS					6	19	27	22	13	21	15	8		43	21	6	14	9	12	15	18	26	15	13	13			
0030	NH TWENTYNINE PALMS					7	1		1									2	1						2				
0032	EVANS ACH-FT. CARSON					1	1						1								1					2			
0032	EVANS ACH-FT. CARSON					2	48	1	25	22	20	27	2	27	26	31	33	41	2		54	77		34	30	34			
0032	EVANS ACH-FT. CARSON					3	60	21	27	19	30	26	23	11	23	28	25	34			42	48	32	44	64	55			
0032	EVANS ACH-FT. CARSON					4	25	23	21	27	24	37	19	17	28	20	34	23	48	43	39	36	32	30	54	41			
0032	EVANS ACH-FT. CARSON					5	20	21	19	7	22	29	18		22	20	69	20	37	47	42	42	31	39	56	37			
0032	EVANS ACH-FT. CARSON					6	22	19	19	23	16	13	14		15	16	23	10	46	36	38	30	28	41	33	24			
0032	EVANS ACH-FT. CARSON					7	1		1					1	1	1	1	1	1	1	1								
0033	10TH MED GROUP-USAF ACADEMY					1																			2				
0033	10TH MED GROUP-USAF ACADEMY					2	23		10	13	9	8		11	10	10	10	5			13	11	1	9	10	5			
0033	10TH MED GROUP-USAF ACADEMY					3	19	6	5	11	8	10	7	6	11	8	3	3		7	12	7	9	10	12				
0033	10TH MED GROUP-USAF ACADEMY					4	11	6	9	9	9	9	12	7	6	10	10	9	4	8	8	6	5	10	8	7			
0033	10TH MED GROUP-USAF ACADEMY					5	7	6	7	8	6	7	12		11	2	1	12	5	11	7	7	4	10	3	10			
0033	10TH MED GROUP-USAF ACADEMY					6	2	4	8	2	6	3	4		9	7	5	8	4	11	6	4		10	12	6			
0033	10TH MED GROUP-USAF ACADEMY					7																			1				
0036	436TH MED GRP-DOVER					2	1																			1			
0036	436TH MED GRP-DOVER					3	38																			3			
0036	436TH MED GRP-DOVER					4			1																	1			
0036	436TH MED GRP-DOVER					5			2																	1			
0036	436TH MED GRP-DOVER					6		1	1	1																1			
0036	436TH MED GRP-DOVER					7					8																		
0037	WALTER REED AMC-WASHINGTON					1	3	1	7	4	3	11	1	1	1	2	6	4								4			
0037	WALTER REED AMC-WASHINGTON					2	288	2	218	121	160	119	4	184	138	160	122	128	2		146	144	1	154	95	145			
0037	WALTER REED AMC-WASHINGTON					3	298	142	311	190	136	109	148	132	148	182	178	159	2	2	136	196	128	163	148	124			
0037	WALTER REED AMC-WASHINGTON					4	144	113	302	170	138	155	155	164	147	108	124	120	62	120	134	162	150	128	100	107			
0037	WALTER REED AMC-WASHINGTON					5	109	120	212	129	126	162	126	1	150	58	137	102	44	87	92	136	107	110	104	86			
0037	WALTER REED AMC-WASHINGTON					6	82	119	213	119	104	132	113	2	124	132	82	60	62	83	104	90	108	88	117	87			
0037	WALTER REED AMC-WASHINGTON					7	3	2	7	2	3	6	1	6	10	1		2	4	11	5	2	25						
0038	NH PENSACOLA					1																				1			
0038	NH PENSACOLA					2	40	5	11	7	6	1	31	16	148	16	11				24	27		23	15	9			
0038	NH PENSACOLA					3	26	5	15	7	11	4	0	16	24	78	21	14	1	20	43	28	21	22	16				

These numbers represent the difference between kept appointments and SADRs received by DHSS

Data Quality Tools – “Difference Detectors”

DMISID	FACILITY	FY	FM	MONTH	Appr Inferred		Raw SADR	RAW SADR - % Less than Inferred	Ext Consistency raw SADR as % of Same Month WWR	WWR
					AApr08	SApr08				
0037	WALTER REED ARMY MEDICAL	2007	02	Nov-06	72,681	70,099	96%		109.74%	63,880
0037	WALTER REED ARMY MEDICAL	2007	03	Dec-06	62,404	60,369	97%		110.57%	54,600
0037	WALTER REED ARMY MEDICAL	2007	04	Jan-07	73,535	71,146	97%		110.88%	64,163
0037	WALTER REED ARMY MEDICAL	2007	05	Feb-07	59,960	57,825	96%		109.53%	52,794
0037	WALTER REED ARMY MEDICAL	2007	06	Mar-07	72,419	69,961	97%		108.13%	64,700
0037	WALTER REED ARMY MEDICAL	2007	07	Apr-07	69,736	67,207	96%		111.18%	60,449
0037	WALTER REED ARMY MEDICAL	2007	08	May-07	73,889	71,046	96%		113.68%	62,496
0037	WALTER REED ARMY MEDICAL	2007	09	Jun-07	69,011	65,868	95%		114.19%	57,684
0037	WALTER REED ARMY MEDICAL	2007	10	Jul-07	64,747	62,396	96%		110.16%	56,640
0037	WALTER REED ARMY MEDICAL	2007	11	Aug-07	69,316	66,869	96%		117.63%	56,848
0037	WALTER REED ARMY MEDICAL	2007	12	Sep-07	62,279	58,674	94%		125.49%	46,756
0037	WALTER REED ARMY MEDICAL	2008	01	Oct-07	78,299	73,914	94%		123.55%	59,824
0037	WALTER REED ARMY MEDICAL	2008	02	Nov-07	69,506	66,624	96%		119.48%	55,761
0037	WALTER REED ARMY MEDICAL	2008	03	Dec-07	57,473	54,954	96%		118.20%	46,491
0037	WALTER REED ARMY MEDICAL	2008	04	Jan-08	75,470	62,533	83%		99.77%	62,679
0037	WALTER REED ARMY MEDICAL	2008	05	Feb-08	68,328	65,453	96%		117.01%	55,939
0037	WALTER REED ARMY MEDICAL	2008	06	Mar-08	62,227	62,227	100%		105.35%	59,066

Data Quality Tools - “Interface Monitoring”

Map of CHCS Sending Facilities to EIDS Operations Site ID and DMIS ID				Msg Receipts at EIDS - March 2008 - By Sending Application									
CHCS Sending Facility	EIDS Ops Site	ID	DMIS ID	Medical Treatment Facility	Service	IV	LAB AP	LAB CH	LAB MI	MED	RAD	RX	
A1411	0110	0110	0110	DARNALL AHC-FT. HOOD	A	Y	Y	Y	Y	Y	Y	Y	
HP0125	0125	0125	0125	MADIGAN AMC-FT. LEWIS	A	Y	Y	Y	Y	Y	Y	Y	
A1631	0131	0131	0131	WEED AHC-FT. IRWIN	A	Y	Y	Y	Y	Y	Y	Y	
HP0330	0330	0330	0330	GUTHRIE AHC-FT. DRUM	A	N	Y	Y	Y	N	Y	Y	
HP0607	0607	0607	0607	LANDSTUHL REGIONAL MEDCEN	A	Y	Y	Y	Y	Y	Y	Y	
A0611	0612	0612	0612	121st GEN HOSP-SEOUL	A	Y	Y	Y	Y	Y	Y	Y	
N68084	0024	0024	0024	NHC CAMP PENDLETON	N	Y	Y	Y	Y	Y	Y	Y	
N66095	0028	0028	0028	NMC MOORE	N	Y	Y	Y	Y	Y	Y	Y	
N00283	0023	0023	0023	NMC SAN DIEGO	N	Y	Y	Y	Y	Y	Y	Y	
HP0035	0035	0035	0035	NACC SPOTON	N	Y	Y	Y	Y	N	Y	Y	
HP0203	0038	0038	0038	NH PENSACOLA	N	Missing 14-23 Mar							
N68032	0033	0033	0033	NH JACKSONVILLE	N	Y	Y	Y	Y	Y	Y	Y	
N00211	0056	0056	0056	NH GREATER LAKES	N	N	Y	Y	Y	N	Y	Y	
HP0031	0001	0001	0001	NH CHAMP LEJUEUNE	N	Y	Y	Y	Y	Y	Y	Y	
N68084	0103	0103	0103	NH CHARLESTON	N	Y	Y	Y	Y	Y	Y	Y	
N00118	0118	0118	0118	NH CORPUS CHRISTI	N	N	Y	Y	Y	N	Y	Y	
N00183	0124	0124	0124	NMC PORTSMOUTH	N	Y	Y	Y	Y	Y	Y	Y	
HP0615	0615	0615	0615	NH GUANTANAMO BAY	N	Y	Y	Y	Y	Y	Y	Y	
HP0616	0616	0616	0616	NH ROOSEVELT ROADS-CEIBA	N	N	N	N	N	N	N	Y	
N68096	0617	0617	0617	NH NAPLES	N	Y	Y	Y	Y	Y	Y	Y	
HP0618	0618	0618	0618	NH ROTA	N	Y	Y	Y	Y	Y	Y	Y	
N68096	0620	0620	0620	NH GUAM-AGANA	N	Y	Y	Y	Y	Y	Y	Y	
N68470	0621	0621	0621	NH OKINAWA	N	Y	Y	Y	Y	Y	Y	Y	
HP0622	0622	0622	0622	NH YOKOSUKA	N	Y	Y	Y	Y	Y	Y	Y	
N68375	0623	0623	0623	NH KEFLAVIK	N	N	N	N	N	N	N	N	
N39163	0624	0624	0624	NH SIGONELLA	N	Y	Y	Y	Y	Y	Y	Y	
HP1170	1170	1170	1170	BMC NSA BAHRAIN	N	N	Y	Y	Y	N	Y	Y	
F0165	0004	0004	42nd MEDICAL GROUP-MAXWELL	F	N	Y	Y	Y	Y	N	Y	Y	
F0252	0006	0006	3rd MED GRP-ELMENDORF	F	Y	Y	Y	Y	Y	Y	Y	Y	
F0452	0009	0009	56th MED GRP-LIKE	F	N	Y	Y	Y	Y	N	Y	Y	
F0451	0010	0010	355th MED GRP-DAVIS MONTBAN	F	N	Y	Y	Y	Y	N	Y	Y	
F0553	0013	0013	314th MED GRP-LITTLE ROCK	F	N	Y	Y	Y	Y	N	Y	Y	
HP0014	0014	0014	60th MED GRP-TRAVIS	F	Y	Y	Y	Y	Y	Y	Y	Y	
F0670	0018	0018	30th MED GRP-VANDEBERG	F	N	Y	Y	Y	Y	N	Y	Y	
F0654	0019	0019	95th MED GRP-EDWARDS	F	N	Y	Y	Y	Y	N	Y	Y	
F1051	0036	0036	436th MED GRP-DOVER	F	N	Y	Y	Y	Y	N	Y	Y	
HP0042	0042	0042	98th MED GRP-EGLIN	F	Missing 1-28 Mar								
HP0043	0043	0043	325th MED GRP-TYNDALL	F	N	Y	Y	Y	Y	N	Y	Y	
HP0045	0045	0045	6th MED GRP-MACDOILL	F	Y	Y	Y	Y	Y	N	Y	Y	
F1256	0046	0046	45th MED GRP-PATRICK	F	N	Y	Y	Y	Y	N	Y	Y	
F1355	0050	0050	347th MED GRP-MOODY	F	N	Missing 1-6 Mar							
F1356	0051	0051	78th MED GRP-ROBINS	F	N	Y	Y	Y	Y	N	Y	Y	
F1651	0053	0053	368th MED GRP-MOUNTAIN HOME	F	Y	Y	Y	Y	Y	Y	Y	Y	
HP0055	0055	0055	325th MED GRP-SCOTT	F	N	Y	Y	Y	Y	N	Y	Y	
F2057	0059	0059	22nd MED GRP-MCCONNELL	F	N	Y	Y	Y	Y	N	Y	Y	
HP0062	0062	0062	2nd MED GRP-BARKSDALE	F	N	Y	Y	Y	Y	N	Y	Y	
F2853	0073	0073	81st MED GRP-KEESLER	F	Y	Y	Y	Y	Y	Y	Y	Y	
F2851	0074	0074	14th MED GRP-COLUMBUS	F	N	Y	Y	Y	Y	N	Y	Y	
F2954	0076	0076	509th MED GRP-WHITEMAN	F	N	Y	Y	Y	Y	N	Y	Y	
F3051	0077	0077	341st MED GRP-MAJLSTROM	F	N	Rcvd 4 Mar only							
HP0078	0078	0078	55th MED GRP-OFFUTT	F	Y	Y	Y	Y	Y	N	Y	Y	
F3251	0079	0079	99th MED GRP-O'CALLAGHAN HOSP	F	Y	Y	Y	Y	Y	N	Y	Y	
F3552	0083	0083	377th MED GRP-KIRTLAND	F	N	N	N	N	N	N	N	Y	
HP0084	0084	0084	49th MED GRP-HOLLOMAN	F	N	Y	Y	Y	Y	N	Y	Y	
F3554	0085	0085	27th MED GRP-CANNON	F	N	Y	Y	Y	Y	N	Y	Y	
FJ456	0639	0639	35th MED GRP-MISAWA	F	Y	Y	Y	Y	Y	Y	Y	Y	
F1752	0808	0808	31st MED GRP-AVIANO	F	Y	Y	Y	Y	Y	Y	Y	Y	
HP0130	aka	0130	USCG CLINIC KODIAK, AK	C	N	Missing 14-23 Mar							
HP0416	cen	0416	MOBILE USCG CLINIC	C	N	Y	Y	Y	Y	N	Y	Y	
HP0428	eas	0428	CAPE MAY COAST GUARD CLINIC	C	N	Y	Y	Y	Y	N	Y	Y	
HP7043	hia	7043	HONOLULU COAST GUARD CLINIC	C	Test Site								
HP0067	ncac	0067	NNMC BETHESDA, MD	N	Y	Y	Y	Y	Y	Y	Y	Y	
HP0418	pac	0418	ALAMEDA COAST GUARD CLINIC	C	N	N	Y	Y	Y	N	Y	Y	
HP7042	pra	7042	BORINQEN COAST GUARD CLINIC	C	N	N	Y	Y	Y	N	Y	Y	

Data Quality Processes

Problem Determination

“File Level” Gaps

- Automated Process
 - e.g. Nothing received as of date
- SADR/CAPER Example
 - Nothing received in >2 days - Email Alert includes Service POCs)

From: admtrak.edwn11_sw@iris.den.disa.mil [mailto:admtrak.edwn11_sw@iris.den.disa.mil]
Sent: Monday, July 30, 2007 11:08 AM
Subject: SADR GAPs

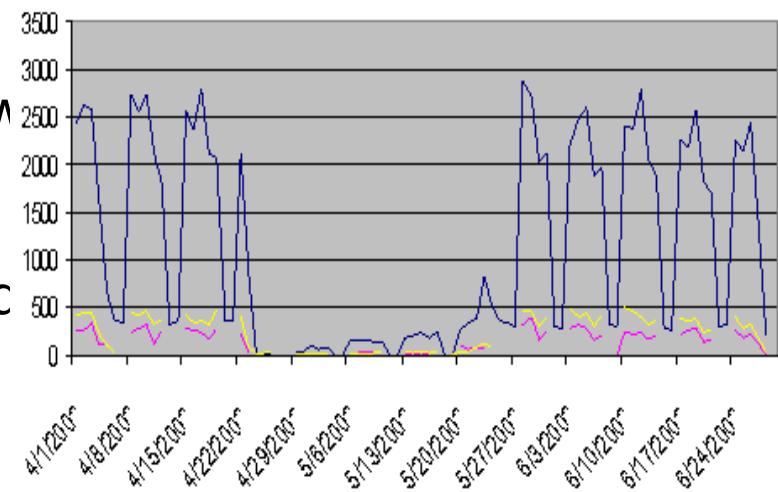
SADR Gaps on 07/29/2007 as of 07/30/2007

Site ID,	Medical Treatment Facility,	Days Missing,	Host,
KAFB0038,	NH PENSACOLA,	4,	edwn35_sw,
KAFB0073,	81st MEDICAL GROUP,	4,	edwn35_sw,
KAFB0316,	NBHC GULFPORT,	4,	edwn35_sw,
KAFB0436,	KGADS,NBHC NAS BELLE CHASE,	4,	edwn35_sw,
KAFB0654,	KGADS,NBHC PASCAGOULA,	4,	edwn35_sw,
KAFB1990,	KGADS,BMC NAVSUPPACT EBANK,	4,	edwn35_sw,

Note Files contain data from many encounter dates. Files may be received daily, but these files may not correlate with CURRENT data)

“Encounter Date” Analysis

- Monthly and ad hoc manual review
- e.g. Run Charts
- NOTE: SPC Control Charts are
 - designed to provide an automated means to perform this activity)



“Non Receipt” Triggers Monthly Analysis

	1/28/2010	1/28/2010	1/29/2010	1/29/2010	1/30/2010	2/4/2010	2/4/2010	2/5/2010	2/5/2010	2/6/2010	2/14/2010	2/15/2010	2/15/2010	2/16/2010	2/16/2010	2/17/2010	2/17/2010	2/18/2010	2/18/2010	2/18/2010
Medical Treatment Facility	Files	Records	Files	Records	Files	Records	Files	Records	Files	Records	Files	Records	Files	Records	Files	Records	Files	Records	Files	Records
LYSTER AHC	1	1049	1	862	1	1	1000	1	803	1										
14th MEDICAL GROUP	1	168	1	177	1	1	140	1	230	1	24	1	19							
BASSETT AHC	1	1190	1	1109	1	1	936	1	1298	1	245	1	340							
FT. GREELY AHC	1	1	1	1	1	1	8	1	22	1	1	1	1							
354th MEDICAL GROUP	1	156	1	177	1	1	153	1	152	1	1	1	1							
FAIRBANKS MEMORIAL HOSPITAL (1	1	1	1	1	1	1	1	1	1	1	1	1							
COMBINED MEDICAL SVCS CLIN-FT.	1	114	1	120	1	1	109	1	176	1	7	1	10							
KAMISH CLINIC-FT. WAINWRIGHT	1	147	1	127	1	1	163	1	192	1	1	1	1							
97th MEDICAL GROUP	1	69	1	5	1			2	2	1	1	1	25	1	197	1	170	1	279	
EVANS ACH	1	6711	1	4775	1	1	5106		2	277	1	333	1	4974	1	5720	1	7148		
10TH MEDICAL GROUP	1	1644	1	1244	1	1	1326		2	76	1	83	1	1251	1	1516	1	1646		
21st MEDICAL GROUP	1	403	1	538	1	1	943		2	37	1	27	1	717	1	778	1	900		
CIV EMP HLTH CLINIC-PUEBLO	1	9	1	21	1	1	18		2	1	1	1	1	13	1	14	1	15		
PREMIER ARMY HEALTH CLINIC	1	292	1	185	1	1	213		2	1	1	19	1	229	1	199	1	262		
460th MED GRP-BUCKLEY AFB	1	498	1	173	1	1	327		2	1	1	1	1	473	1	543	1	356		
TMC 10-FT. CARSON	1	478	1	378	1	1	172		2	2	1	14	1	217	1	188	1	278		
TMC 9-FT. CARSON	1	462	1	324	1	1	256		2	3	1	12	1	310	1	314	1	329		
WARRIOR CLINIC-FT. CARSON	1	472	1	316	1	1	254		2	2	1	3	1	266	1	281	1	363		

List of Problem Facilities - AUTOMATED IDENTIFICATION USING STATISTICAL PROCESS CONTROL ALGORITHMS

Human Interpretation: 2 files after one day gap and volume appears consistent with prior "same days"

STATISTICAL PROCESS CONTROL - Determines that volume for X days is NOT consistent with prior data

SPC AND File Absence Alerting

Data Quality Processes

A set of three horizontal arrows: a red double-headed arrow at the top, a blue double-headed arrow in the middle, and a green double-headed arrow at the bottom.

Problem Resolution Process : IF “file level” OR “encounter date level” problem detected:

- Immediate MHS Help Desk Ticket
- Notification if problem is deemed “significant and or long standing”
- Determination if “Blaster” message to analytical community is appropriate or required. Note that individual site “transient” halts in transmission occur regularly and are usually resolved quickly. These “transient” problems are not reported in real time as M2 utilizes a batch process and problems are often resolved between batch processing cycles.
- Coordination with “Service POCs” to determine if problem also exists in “Service” databases.
- Recovery of files via sharing between service databases and DHSS
- Tier III recovery/reharvest of missing data (except HL7 and Ancillary as no reharvest mechanism exists)

Data Quality Processes

A set of three horizontal arrows: a double-headed arrow on the left, a single-headed arrow pointing right in the middle, and a double-headed arrow on the right.

Common Problems - In Order of Occurrence

4 Broad Categories

- Provider/Coding Issues
 - “Slow Coding” from the data receipt perspective (as compared to other like facilities)
 - Provider “left”
- Transmission/Send of Data
 - Sy_ETU Problems
 - Host Issues (e.g. Change Package induced problems)
- Network Routing Issues
- Ingest or Processing (e.g. DHSS downtime – very rare)

DHSS's Tools Improve MHS Data Quality



And allow DHSS to

Catalog data files

Monitor data completeness

Provide metrics to assess data quality/completeness of data received

Design, develop and maintain data quality software

The Key To Data Quality Success

A horizontal line consisting of three parallel lines with small arrowheads pointing in opposite directions at the ends.

Partnering with our users to
maximize information
sharing

Questions?